

NOTES ON THE LEGUMINOSAE II.
FACULTATIVE DWARFISM IN
CROTALARIA SAGITTALIS L.¹

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In his study of the North American species of *Crotalaria*, based on herbarium specimens, Senn (1939) described a dwarf *Crotalaria sagittalis* L. from rocky, xeric habitats in the American Southwest and Mexico to which he gave the name, variety *Blumeriana*. During the fall of 1967, while studying unifoliolate species of *Crotalaria* in North America (1970), I was able to observe a number of Mexican populations of this dwarf form in the field. In most locations visited, larger plants of *C. sagittalis* were often found growing in more favorable areas, near populations of variety *Blumeriana*. The consistency of this association seemed to place the status of the variety in question.

In the summer of 1968 plants reared from seeds of two "*Blumeriana*" populations (*Windler & Windler* 2950 — State of Jalisco; *Windler & Windler* 2981 — State of Oaxaca) were planted along with representatives of other species in a common garden plot at the North Carolina Botanical Gardens. A total of 47 plants, progeny of eleven seed parents from the two field populations, were grown. All plants grown in the garden plots were substantially larger than their field grown parents (see Figures 1 & 2). Plants from the field populations rarely grew to one decimeter in height and were mostly less than 0.7 dm. tall. Garden grown offspring of these plants grew to heights of three to seven decimeters. In addition to stem length, substantial increases were also observed in fruit size and number of fruits per plant. Garden plants from the dwarf seed parents com-

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Figure 1. A. Herbarium specimen of *Crotalaria sagittalis* "var. *Blumeriana*". B. A branch of a specimen grown from seed produced by the plant shown in Figure 1A.

pared favorably in general size with those from non-dwarf seed parents.

During preparation for the garden plantings, seeds were scratched and soaked overnight before being placed in the soil. At planting time, the 47 seeds from the dwarf populations were swollen and the radical was strongly exerted from the seed coat. In contrast, among the more than 1,000 seeds from 62 other North American *Crotalaria* populations, all were swollen at planting time but none showed an exerted radicle.

DISCUSSION

Based upon the above information, the plants that Senn recognized as var. *Blumeriana* appear to be ecophenes of Mexican *Crotalaria sagittalis* ecotypes that are adapted to xeric, rocky conditions where moisture becomes available but is soon depleted. Under these conditions organisms must produce seeds which germinate quickly, and the resulting plants must quickly develop to a physiological stage conducive to flowering and fruit set if the population is to continue to exist. Plants of most other *Crotalaria* populations in North America have not evolved under similar pressures and have not developed the quick germination response shown by the Mexican dwarf plants.

The ability to germinate quickly and produce seed at a small plant size appear to be genetically controlled, but the latter characteristic is not expressed unless the plant is developing in a xeric situation. Consequently no formal recognition should be accorded to the epithet *Blumeriana*.

LITERATURE CITED

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